Fisher® 1078 Declutchable Manual Actuator

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Figure 1. Fisher 1078 Manual Actuator Mounted on a 1052 Size 33 Actuator

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Introduction

Scope of Manual

This instruction manual includes installation, operation, and maintenance information for the Fisher 1078 declutchable manual actuator (figure 1). Refer to separate instruction manuals for instructions covering the power actuator and control valve.

Do not install, operate, or maintain a 1078 declutchable manual actuator without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. **To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings.** If you have any questions about these instructions, contact your Emerson Process Management sales office before proceeding.

Table 1. Specifications

Available Configurations

Direct and reverse acting; see Handwheel Rotation in this specification table

Actuator Sizes

See tables 2, 3, 4 and 5

Acceptable Coupling Shaft Diameters

See tables 2, 3, 4 and 5

Power Actuator Compatibility

See tables 2, 3, 4 and 5

Output Torque

See tables 2, 3, 4 and 5

Wheel-Rim Force

See tables 2, 3, 4 and 5

Handwheel Turns Required For Full Rotation

See tables 2, 3, 4 and 5

Handwheel Rotation

Direct Acting Construction: Clockwise handwheel rotation closes the valve (produces clockwise valve shaft rotation)

Reverse Acting Construction: Clockwise handwheel rotation closes the valve (produces counterclockwise valve shaft rotation)

Decide whether Direct or Reverse Action is required by referring to the appropriate valve or power actuator instruction manual and determining valve rotation.

Maximum Output Rotation

90 degrees; limited by travel stops in the power actuator

Standard Mounting Positions

1051 (size 33) and 1052 (size 33): handwheel down

1051 (sizes 40 and 60) and 1052 (sizes 40, 60, and 70)(1): handwheel down (std) or handwheel right-hand or left-hand mount (optional)

1061 (sizes 30, 40, 60, 68, 80, and 100)(1): handwheel down (std) or handwheel right-hand or left-hand mount (optional)

1066 and 1066SR: handwheel to the left or, with a Fisher 67CFR, handwheel down

Approximate Weights without Handwheel

Size AAA: 2.7 kg (6 lb)
Size AA: 6.8 kg (15 lb)
Size A: 9.5 kg (21 lb)
Size 2A: 13.6 kg (30 lb)
Size 1A: 15.9 kg (35 lb)
Size B: 23.1 kg (51 lb)
Size C: 29.9 kg (66 lb)
Size D: 63.5 kg (140 lb)
Size II-FA: 81.6 kg (180 lb)

Handwheel Weight

6-inch: 1.8 kg (4 lb)
8-inch: 2.3 kg (5 lb)
12-inch: 3.2 kg (7 lb)
16-inch: 6.8 kg (15 lb)
24-inch: 5.4 kg (12 lb)
30-inch: 6.4 kg (14 lb)
36-inch: 7.3 kg (16 lb)

1. If a positioner is used, the right-hand or left-hand mounting option will be limited to the side away from the positioner.

Description

The 1078 manual actuator, shown in figures 1 and 2, is a declutchable unit for manual operation of control valves and equipment that use power actuators. The 1078 manual actuator mounts directly to Fisher 1051 sizes 33, 40, and 60; 1052 sizes 33, 40, 60, and 70; 1061 sizes 30, 40, 60, 68, 80, and 100; and to all sizes of 1066 or 1066SR actuators. The 1078 manual actuator can be engaged to allow manual operation of the valve when the power actuator is not in use. It can be disengaged to allow automatic operation of the valve by the power actuator. The mechanism used allows manual actuator engagement at any point of power actuator rotation.

For 1051 size 33, 1052 size 33, 1066, and 1066SR actuators, coupling to the power actuator is via a flatted shaft installed in the lever or hub. The dimensions of these shafts are the same as those used with H mounting adaptations. The stub shaft fits into a square broach in the manual actuator sector, and spacers secure the shaft in the appropriate position.

H and J mounting adaptations are the mounting methods normally used to mount 1051, 1052, 1061, 1066 and 1066SR actuators on equipment and valves not manufactured by Emerson Process Management. F and G mounting adaptations are the mounting methods normally used to mount 1051, 1052, 1061, 1066 and 1066SR actuators on valves manufactured by Emerson Process Management.

For all sizes of the 1066 or 1066SR actuators, coupling to the power actuator is in the hub of the 1066 or 1066SR actuator.

Figure 2. Fisher 1078 Declutchable Manual Actuator Mounted on a 1052 Size 40 Actuator and V500 Valve

Specifications

1078 manual actuator specifications are given in table 1. Specifications for a control valve assembly as it comes from the factory appear on a nameplate attached to the power actuator.

Educational Services

For information on available courses for 1078 manual actuators, as well as a variety of other products, contact:

Emerson Process Management
Educational Services, Registration
P.O. Box 190; 301 S. 1st Ave.
Marshalltown, IA 50158-2823
Phone: 800-338-8158 or
Phone: 641-754-3771
FAX: 641-754-3431
e-mail: education@emerson.com

Table 2. Fisher 1051, 1052, and 1066SR Actuator Size Selection and Specifications for Sizes AAA, AA, and A

MANUAL ACTUATOR SIZE (max output torque)	SHAFT SIZE[1]		POWER ACTUATOR[2]		GEAR RATIO	HANDWHEEL DIAMETER		MAXIMUM TORQUE[3]		WHEEL-RIM-FORCE				HANDWHEEL TURNS FOR ROTATION	
										For Maximum Torque		For Less Than Maximum Torque		Degrees	
	mm	Inch	Type	Size		mm	Inch	N•m	Lbf•in	N	Pounds	N	Pounds	60	90
AAA (2400 in.lbs)	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8, 1)	1051	33	24.1	305	12	143 223 271 271	1271 1981 2400 2400	157 245 298 298	35 55 67 67	Divide N•m req'd by 0.91	Divide lbf•in req'd by 36	4	6
	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8, 1)	1052	33				190 270 271 271	1681 2391 2400 2400	209 297 298 298	47 66 67 67				
	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8, 1)	1066SR	20				169 249 271 271	1495 2205 2400 2400	186 274 298 298	42 61 67 67				
AA (4800 in.lbs)	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8 ,1)	1066SR	27	34.1	305	12	283 363 464 541	2515 3225 4120 4800	218 279 357 416	49 63 81 94	Divide N•m req'd by 1.3	Divide lbf•in req'd by 51	5.7	8.5
A (8200 in.lbs)	19.1 (22.2, 25.4) (31.8, 38.1)	3/4 (7/8, 1) (1-1/4,1-1/2)	1066SR	75	32.1	610	24	717 926 926	6350 8200 8200	299 385 385	66 85 85	Divide N•m req'd by 2.4	Divide lbf•in req'd by 96	5.3	8

1. Requires flatted shaft as in the H mounting adaptation.
2. Field conversion of actuators for F and G mounting adaptations requires installation of new parts. The 1051 or 1052 Size 33 actuator requires installation of appropriate lever and stub shaft. The 1066 actuator requires installation of appropriate hub assembly.
3. Compare table value with torque requirements of the valve plus the torque required to compress the power actuator spring (from Fisher Catalog 14). Note that dynamic torque of the valve may have a positive or negative effect on total torque required.

Table 3. Fisher 1066 Actuator Size Selection and Specifications for Sizes AAA, AA, and A

MANUAL ACTUATOR SIZE (max output torque)	SHAFT SIZE[1]		POWER ACTUATOR[2]		GEAR RATIO	HANDWHEEL DIAMETER		MAXIMUM TORQUE[3]		WHEEL-RIM-FORCE				HANDWHEEL TURNS FOR ROTATION	
										For Maximum Torque		For Less Than Maximum Torque		Degrees	
	mm	Inch	Type	Size		mm	Inch	N•m	Lbf•in	N	Pounds	N	Pounds	60	90
AAA (2400 in.lbs)	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8, 1)	1066	20	24.1	305	12	58 138 239 271	515 1225 2120 2400	62 151 262 298	14 34 59 67	Divide N•m req'd by 0.91	Divide lbf•in req'd by 36	4	6
AA (4800 in.lbs)	12.7 15.9 19.1 (22.2, 25.4)	1/2 5/8 3/4 (7/8, 1)	1066	27	34.1	305	12	58 138 239 467	515 1225 2120 4140	44 106 182 360	10 24 41 81	Divide N•m req'd by 1.3	Divide lbf•in req'd by 51	5.7	8.5
A (8200 in.lbs)	19.1 (22.2, 25.4) (31.8, 38.1)	3/4 (7/8, 1) (1-1/4, 1-1/2)	1066	75	32.1	610	24	239 467 926	2120 4140 8200	98 191 385	22 43 85	Divide N•m req'd by 2.4	Divide lbf•in req'd by 96	5.3	8

1. Requires flatted shaft as in the H mounting adaptation.
2. Field conversion of actuators for F and G mounting adaptations requires installation of new parts. The 1066 actuator requires installation of appropriate hub assembly.
3. Compare table value with torque requirements of the valve plus the torque required to compress the power actuator spring (from Fisher Catalog 14). Note that dynamic torque of the valve may have a positive or negative effect on total torque required.

Table 4. Fisher 1051 and 1052 Actuator Size Selection and Specifications for Sizes 2A, 1A, B, and C

MANUAL ACTUATOR SIZE (max output torque)	SHAFT SIZE		POWER ACTUATOR(1)		GEAR RATIO	HANDWHEEL DIAMETER		MAXIMUM TORQUE(2)		WHEEL-RIM-FORCE				HANDWHEEL TURNS FOR ROTATION	
										For Maximum Torque		For Less Than Maximum Torque		Degrees	
	mm	Inch	Type	Size		mm	Inch	N•m	Lbf•in	N	Pounds	N	Pounds	60	90
2A (4800 in.lbs)	12.7	1/2	1051	40	34:1	203	8	380	3365	441	99	Divide N•m req'd by 0.86	Divide lbf•in req'd by 34	5.7	8.5
	15.9, 14.3x 9.5	5/8, 9/16x 5/8	1051	40	34:1	305	12	460	4075	354	80	Divide N•m req'd by 1.3	Divide lbf•in req'd by 51		
	19.1	3/4(3)						541	4800	416	94				
	(22.2, 25.4)	(7/8, 1)						467(4)	4140(4)	360	81				
	31.8	1-1/4						541	4800	416	94				
	12.7	1/2	1052	40		305	12	429	3795	330	74	Divide N•m req'd by 1.3	Divide lbf•in req'd by 51		
	15.9, 14.3x 9.5	5/8, 9/16x 5/8						509	4505	392	88				
	19.1	3/4(3)						541	4800	416	94				
	(22.2, 25.4)	(7/8, 1)						467(4)	4140(4)	360	81				
	31.8	1-1/4						541	4800	416	94				
1A (8200 in.lbs)	31.8	1-1/4	1051 1052	40 40	32:1	610	24	929	8200	378	85	Divide N•m req'd by 2.4	Divide lbf•in req'd by 96	5.3	8
	(22.2, 25.4)	(7/8, 1)	1051 1052	60 60											
	31.8, 28.6x 31.8	1-1/4, 1-1/8x 1-1/4	1051	60											
	38.1 31.8x 38.1	1-1/2, 1-1/4x 1-1/2	1052	60											
	(44.4, 50.8), 39.7 x44.5	(1-3/4, 2), 1-9/16 x1-3/4	1052	70											
B (12,000 in.lbs)	31.8	1-1/4	1051 1052 1052	60 60 70	40:1	610	24	1356	12,000	369	83	Divide N•m req'd by 3.6	Divide lbf•in req'd by 144	6.7	10
	38.1, (44.4, 50.8)	1-1/2, (1-3/4, 2)													
C (18,000 in.lbs)	31.8	1-1/4	1051	60	54:1	610	24	1735	15,355	361	79	Divide N•m req'd by 4.8	Divide lbf•in req'd by 194	9	13.5
			1052	60				1839	16,275	383	84				
			1052	70				2034	18,000	414	93				
	(44.4, 50.8)	(1-3/4, 2)	1051 1052 1052	60 60 70				2034	18,000	414	93				

1. Field conversion of actuators for F and G mounting adaptations requires installation of new parts.
2. Compare table value with torque requirements of the valve plus the torque required to compress the power actuator spring (from Fisher Catalog 14). Note that dynamic torque of the valve may have a positive or negative effect on total torque required.
3. 2A 3/4 inch shaft will also mount on the 1051 and 1052 size 60.
4. Maximum torque of connection between power and manual actuator.

Table 5. Fisher 1061, 321, and 354 Actuator Size Selection and Specifications for Sizes 2A, 1A, B, C, D, and II-FA

MANUAL ACTUATOR SIZE (max output torque)	SHAFT SIZE		POWER ACTUATOR		GEAR RATIO	HANDWHEEL DIAMETER		MAXIMUM TORQUE(1)		WHEEL-RIM-FORCE				HANDWHEEL TURNS FOR ROTATION	
										For Maximum Torque		For Less Than Maximum Torque		Degrees	
	mm	Inch	Type	Size		mm	Inch	N•m	Lbf•in	N	Pounds	N	Pounds	60	90
2A (4800 in.lbs)	12.7	1/2	1061	30	34:1	152	6	58	515	89	20	Divide N•m req'd by 0.66	Divide lbf•in req'd by 26	5.7	8.5
	15.9, 14.3x 9.5	5/8, 9/16x 5/8						138	1225	214	48				
	19.1	3/4(3)				203	8	239	2120	276	62	Divide N•m req'd by 0.86	Divide lbf•in req'd by 34		
	(22.2, 25.4)	(7/8, 1)				305	12	467(4)	4140(4)	360	81	Divide N•m req'd by 1.3	Divide lbf•in req'd by 51		
	31.8	1-1/4						541	4800	416	94				
1A (8200 in.lbs)	(22.2, 25.4)	(7/8, 1)	354, 321	60, 60	32:1	305	12	467	4140	382	86	Divide N•m req'd by 1.2	Divide lbf•in req'd by 48	5.3	8
	31.8, 28.6x 31/8	1-1/4, 1-1/8x 1-1/4				610	24	929	8200	387	85	Divide N•m req'd by 2.4	Divide lbf•in req'd by 96		
	38.1 31.8x 38.1	1-1/2, 1-1/4x 1-1/2													
	(44.4, 50.8), 39.7 x44.5	(1-3/4, 2), 1-9/16 x1-3/4													
	(22.2, 25.4)	(7/8, 1)	1061	40, 60, 68		305	12	467	4140	382	86	Divide N•m req'd by 1.2	Divide lbf•in req'd by 48		
	31.8, 28.6x 31/8	1-1/4, 1-1/8x 1-1/4				610	24	929	8200	378	85	Divide N•m req'd by 2.4	Divide lbf•in req'd by 96		
	38.1 31.8x 38.1	1-1/2, 1-1/4x 1-1/2													
	(44.4, 50.8), 39.7 x44.5	(1-3/4, 2), 1-9/16 x1-3/4													

- continued -

Table 5. Fisher 1061, 321, and 354 Actuator Size Selection and Specifications for Sizes 2A, 1A, B, C, D, and II-FA (continued)

MANUAL ACTUATOR SIZE (max output torque)	SHAFT SIZE		POWER ACTUATOR		GEAR RATIO	HANDWHEEL DIAMETER		MAXIMUM TORQUE(1)		WHEEL-RIM-FORCE				HANDWHEEL TURNS FOR ROTATION	
										For Maximum Torque		For Less Than Maximum Torque		Degrees	
	mm	Inch	Type	Size		mm	Inch	N•m	Lbf•in	N	Pounds	N	Pounds	60	90
B (12,000 in.lbs)	31.8	1-1/4	354, 321	60, 60	40:1	610	24	1109	9815	308	68	Divide N•m req'd by 3.6	Divide lbf•in req'd by 144	6.7	10
	38.1, (44.4, 50.8)	1-1/2, (1-3/4, 2)						1356	12,000	377	83				
	31.8	1-1/4	1061	40, 60, 68				1109	9815	308	68				
	38.1, (44.4, 50.8)	1-1/2, (1-3/4, 2)						1356	12,000	377	83				
C (18,000 in.lbs)	31.8	1-1/4	354, 321	60, 60	54:1	610	24	1109	9815	231	51	Divide N•m req'd by 4.8	Divide lbf•in req'd by 194	9	13.5
	(44.4, 50.8)	(1-3/4, 2)						2034	18,000	424	93				
	31.8	1-1/4	1061	40, 60, 68				1109	9815	231	51				
	(44.4, 50.8)	(1-3/4, 2)						2034	18,000	424	93				
D (30,000 in.lbs)	(44.4, 50.8)	(1-3/4, 2)	354, 321	80, 80	64:1	762	30	2658	23,524	369	82	Divide N•m req'd by 7.2	Divide lbf•in req'd by 287	10.7	16
	54, 63.5 57.2x 63.5	2-1/8, 2-1/2, 2-1/4x 2-1/2				914	36	3390	30,000	394	87	Divide N•m req'd by 8.6	Divide lbf•in req'd by 345		
	(44.4, 50.8)	(1-3/4, 2)	1061	80, 100		762	30	2658	23,524	369	82	Divide N•m req'd by 7.2	Divide lbf•in req'd by 287		
	54, 63.5 57.2x 63.5	2-1/8, 2-1/2, 2-1/4x 2-1/2				914	36	3390	30,000	394	87	Divide N•m req'd by 8.6	Divide lbf•in req'd by 345		
II-FA (60,000 in.lbs)	54, 63.5	2-1/8, 2-1/2	354, 321	80, 80	288:1(2)	406	16	6301	55,762	400	90	Divide N•m req'd by 15.7	Divide lbf•in req'd by 619	48	72
	54, 63.5	2-1/8, 2-1/2	1061	80, 100											

1. Compare table value with torque requirements of the valve plus the torque required to compress the power actuator spring (from Fisher Catalog 14). Note that dynamic torque of the valve may have a positive or negative effect on total torque required.
2. Has spur gear.
3. 2A 3/4 inch shaft will also mount on the 1061 size 40, 60, and 68.
4. Maximum torque of connection between power and manual actuator.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.

Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

The 1078 manual actuator is normally shipped mounted on a power actuator. If the manual actuator has been shipped separately for installation on a power actuator, or if the manual actuator was removed for maintenance, mount the manual actuator by following the instructions presented in this section.

Individual part key numbers and part descriptions referenced in this procedure are shown in figure 3.

Converting An Existing Power Actuator For Use With The Fisher 1078 Manual Actuator

Field conversion of a power actuator for use with the 1078 manual actuator may require replacement and/or removal of some parts. The procedures which follow apply only to power actuators which were not ordered specifically for use with the 1078 manual actuator. Proceed as appropriate:

For manual actuator installation on a 1051 or 1052 size 33 power actuator with F or G mounting adaptation without wrench-operated extension, a new lever with stub shaft must be installed in place of the standard lever. The standard power actuator travel indicator components are omitted. Refer to the power actuator instruction manual.

For manual actuator installation on a 1051 or 1052 size 33 power actuator with F or G mounting adaptation with wrench-operated extension, the manual actuator will mount directly to the power actuator after the power actuator travel indicator components have been removed from the power actuator.

For manual actuator installation on a 1051 or 1052 size 33 power actuator with H or J mounting adaptation, dual stub shaft construction is required. If the power actuator is a single stub shaft construction, the lever must be removed and a second stub shaft installed. The standard power actuator travel indicator components are omitted. Refer to the power actuator instruction manual. If the power actuator has dual stub shaft construction (wrench-operated extension), the manual actuator will mount directly to the power actuator after the power actuator travel indicator components have been removed from the power actuator.

For manual actuator installation on 1061 sizes 30, 40, 60, 68, 80, and 100; 1051 sizes 40 and 60; and 1052 sizes 40, 60, and 70 remove the actuator cover (key 34) and attached parts from 1061, 1051, or 1052. Replace with 1078. Most assemblies require installation of a new lever and splined adaptor to complete the installation. When used, the splined adaptor slides inside the new lever and the lever is then clamped onto the splined adaptor. See figure 6.

CAUTION

The travel indicator scale supplied with the 1066 and 1066SR power actuator is thicker than the scale supplied with the 1078 manual actuator. Because the scale serves as a pressure containing and component positioning part, it is imperative that the thicker scale originally mounted on the 1066 and 1066SR be returned to its original position before mounting the 1078 manual actuator. Failure to use the thicker plate may result in damage to internal components and unreliable performance of the power actuator.

For manual actuator installation on a 1066 or 1066SR power actuator with F or G mounting adaptation, a hub assembly with shaft extension must be installed in place of the standard hub assembly. Make certain that the travel indicator scale originally supplied with the 1066 and 1066SR power actuator is installed on the power actuator before mounting the 1078 manual actuator. The 1066 and 1066SR travel indicator scale is thicker than the scale shipped with the 1078 manual actuator and is used as a pressure retaining and component positioning part. The travel indicator pointer and its mounting parts are not used. Refer to the power actuator instruction manual.

For manual actuator installation on a 1066 or 1066SR power actuator with H mounting adaptation, the manual actuator will mount directly to the power actuator after the travel indicator pointer, travel indicator pointer retaining ring, and the travel indicator scale retaining ring have been removed from the manual actuator side of the power actuator. Make certain that the travel indicator scale originally supplied with the 1066 and 1066SR power actuator is

installed between the manual and power actuator. 1066 and 1066SR travel indicator scale is thicker than the scale shipped with the 1078 manual actuator and is used as a pressure retaining and component positioning part. The travel indicator pointer, the travel indicator pointer retaining ring, and the travel indicator scale retaining ring (quantity of 1) originally installed on the manual actuator side of the power actuator are not used.

Installing the Manual Actuator

⚠ WARNING

Avoid personal injury from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the power actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline.* Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

CAUTION

Undertravel or overtravel of the valve ball or disc, especially at the closed position, may result in poor valve performance and/or damage to the equipment. Make certain that the power actuator travel stops are properly set before installing and adjusting the manual actuator. Refer to the instruction manuals for the valve and the power actuator for information about setting travel stops.

1. Isolate the control valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. Also shut off all pressure lines to the power actuator and release all pressure from the power actuator. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
2. Make certain that the power actuator travel stops have been properly set according to the caution given above.
3. For spring-return power actuators, allow the power actuator to remain in the position where the spring is relaxed. For double-acting power actuators, apply supply pressure as appropriate to position the valve disc or ball in either the open or closed position.
4. Note whether the valve disc or ball is in the open or closed position.
5. Rotate the handwheel to move the drive sleeve gear and travel indicator to the position that corresponds with the position of the valve disc or ball. For both direct and reverse acting manual actuators, clockwise handwheel rotation sets the manual actuator to the closed position. Counterclockwise handwheel rotation sets the manual actuator to the open position.

Proceed as appropriate to step 6 or step 16.

For 1051 (size 33), 1052 (size 33), and 1066 and 1066SR (all sizes).

6. Remove the machine screws and the travel indicator pointer (keys 6 and 5). Remove the travel indicator scale and gear box cover plate.
7. Slide the manual actuator over the power actuator stub shaft.
8. Install the spacers (figure 3) to secure the flatted shaft in the drive gear sleeve. Use the handwheel to position the drive sleeve gear if necessary.
9. Disengage the manual actuator.
10. Install the manual actuator, the gearbox cover plate, and the travel indicator scale on the power actuator with the cap screws provided. Prior to tightening the cap screws to a final torque value, the power actuator will be stroked to center the manual actuator. Therefore, the cap screws must be tightened to the degree that they will keep the manual actuator in position while allowing some minor movement for centering during the stroking operation.
11. Apply supply pressure to the power actuator and fully stroke the power actuator through its range. Tighten the cap screws which secure the manual actuator to the power actuator, but do not apply final torque. Repositioning of the manual actuator should be allowed during the next step.
12. To complete the centering procedure, stroke the power actuator to the other end of its stroking range and apply the final torque value to the cap screws.
13. Cycle the power actuator several times and check the power actuator and manual actuator for free operation. If there is evidence of binding or other malfunction, loosen the manual actuator and repeat the centering operation beginning with step 10 above.
14. Install the travel indicator pointer so that it indicates the true position of the valve ball or disc.
15. For double-acting power actuators, be certain the power actuator is equipped with a bypass valve. Operating the handwheel mechanism against the force of differential cylinder pressures will be difficult or impossible.

For 1051 (sizes 40 and 60), 1052 (sizes 40, 60, and 70), and 1061 (sizes 30, 40, 60, 68, 80, and 100).

16. Remove the lever and add a new lever and splined adaptor when needed. See figure 6.

The splined adaptor slides inside the new lever and the lever is then clamped onto the splined adaptor.

17. Disengage the manual actuator.
18. Install the manual actuator
19. Tighten the cap screws to the final torque value.
20. For double-acting power actuators, be certain the power actuator is equipped with a bypass valve. Operating the handwheel mechanism against the force of differential cylinder pressures will be difficult or impossible.

Operation

After the travel indicator pointer has been adjusted and the control valve assembly installed, the manual actuator is ready for operation.

CAUTION

Applying too much torque to the actuator and valve parts could cause damage to the parts. To avoid such damage, do not exceed the maximum allowable torques listed in table 3 or any other torque limitation of internal valve parts. Also, do not use wrenches or other devices on the handwheel or handwheel shaft to increase operating force.

If the force required to rotate the handwheel exceeds the wheel-rim force listed in tables 2, 3, 4 and 5, refer to the maintenance procedure.

Engaging and Disengaging the Manual Actuator

Engaging the Manual Actuator

1. Shut off the supply pressure to the power actuator.
2. Pull the ring on the detent mechanism to unlock the lever. Move the lever into the engaged position until it is against the stop pin and locked in position by the detent mechanism. (Note that stop pins are not available on 1078 size II-FA actuators.)
3. If applicable, open the power actuator bypass valve.

Disengaging the Manual Actuator

CAUTION

Disengaging the manual actuator when forces such as spring compression, cylinder pressure, and dynamic torque are present may cause sudden, extreme movement of all control valve components. This can result in damage to equipment and violent disturbance of the process. Before disengaging the manual actuator, take appropriate steps to ensure that the return to automatic operation will not result in an extreme repositioning of control valve components. Procedures to determine approximate system balance are given in the following steps.

1. Before disengaging the manual actuator, approximate system balance should be achieved. The system is in balance when the actual valve ball or disc position is approximately the same as the position requested by the automatic control system. Under balanced system conditions, the manual actuator disengaging lever moves freely without use of excessive force. If after releasing the detent mechanism, the lever does not move freely toward the disengaged position, some system force is causing an imbalance. A forced return to automatic operation under these conditions can cause serious damage to the equipment and violent disturbance of the process.
2. If possible, determine whether the automatic control system is tending to open or close the valve ball or disc, and rotate the handwheel in the appropriate direction until friction in the manual operator is reduced and the lever can be easily moved by hand. As an alternate approach, local manipulation of the supply pressure to the power actuator may bring the set point of the automatic system closer to the actual valve ball or disc position.
3. If a smooth transition from manual to automatic operation cannot be ensured, isolate the valve from the process. Position the manual actuator so that it matches the position of the ball or disc when no supply pressure is applied to the power actuator.
4. Pull the ring on the detent mechanism to unlock the lever. Push the lever into the disengaged position until it is against the stop pin and locked in position by the detent mechanism. (Note that stop pins are not available on 1078 size II-FA actuators.)
5. Close the bypass valve and return supply pressure to the power actuator.

Maintenance

If the force required to rotate the handwheel exceeds the wheel-rim force listed in tables 2, 3, 4 and 5, check for the following conditions:

- Insufficient lubrication,
- Seized actuator parts,
- Excessive pressure drop across the valve body, or
- Obstruction to the valve disc or ball rotation.

If the manual actuator does not seem to control the process fluid, the worm or drive sleeve gear teeth may be broken, the pin (key 3) may be sheared, or the internal power actuator or valve parts may be broken. Purchase a replacement manual actuator if necessary. Refer to the power actuator and valve instruction manuals if power actuator or valve maintenance is needed.

Lubrication

The interior parts of the 1078 manual actuator should be lubricated on a regular schedule with a quality gear lubricant. The interior parts should also be lubricated whenever difficulty in handwheel rotation indicates a need for lubrication.

⚠ WARNING

Avoid personal injury from sudden release of process pressure or uncontrolled movement of parts. Before performing any maintenance operations:

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the power actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline.* Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

1. Isolate the control valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. If using a power actuator, also shut off all pressure lines to the power actuator, release all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
2. Mark the position of the travel indicator pointer on the indicator dial. The travel indicator pointer must be returned to its original position when assembling the manual actuator. Remove the machine screws and the travel indicator pointer.

3. **For 1051 (size 33), 1052 (size 33), and 1066 and 1066SR (all sizes),** remove the cap screws which secure the manual actuator to the power actuator and remove the manual actuator.

For 1051 (sizes 40 and 60), 1052 (sizes 40, 60, and 70), and 1061 (sizes 30, 40, 60, 68, 80, and 100), remove the manual actuator cover screws.

4. Remove the travel indicator scale and the gearbox cover plate. Coat the worm, the drive sleeve gear teeth, and the bearing surfaces of the gearbox housing and worm with a quality gear lubricant.
5. Install the cover plate and the travel indicator scale on the gearbox.
6. **For 1051 (size 33), 1052 (size 33), and 1066 and 1066SR (all sizes),** to install the manual actuator on the power actuator, refer to the Installation procedure and perform all applicable steps.

For 1051 (sizes 40 and 60), 1052 (sizes 40, 60, and 70), and 1061 (sizes 30, 40, 60, 68, 80, and 100), replace the manual actuator cover screws.

Parts Ordering

When corresponding with your Emerson Process Management sales office, indicate the type number and size of the power actuator and the mounting adaptation used. If the manual actuator was shipped separately (not attached to a power actuator), give the serial number of the unit, which is shown on a tag attached to the manual actuator.

For 1051 (sizes 40 and 60), 1052 (sizes 40, 60, and 70), and 1061 (sizes 30, 40, 60, 68, 80, and 100), indicate valve shaft size.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Process Management should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

Parts List

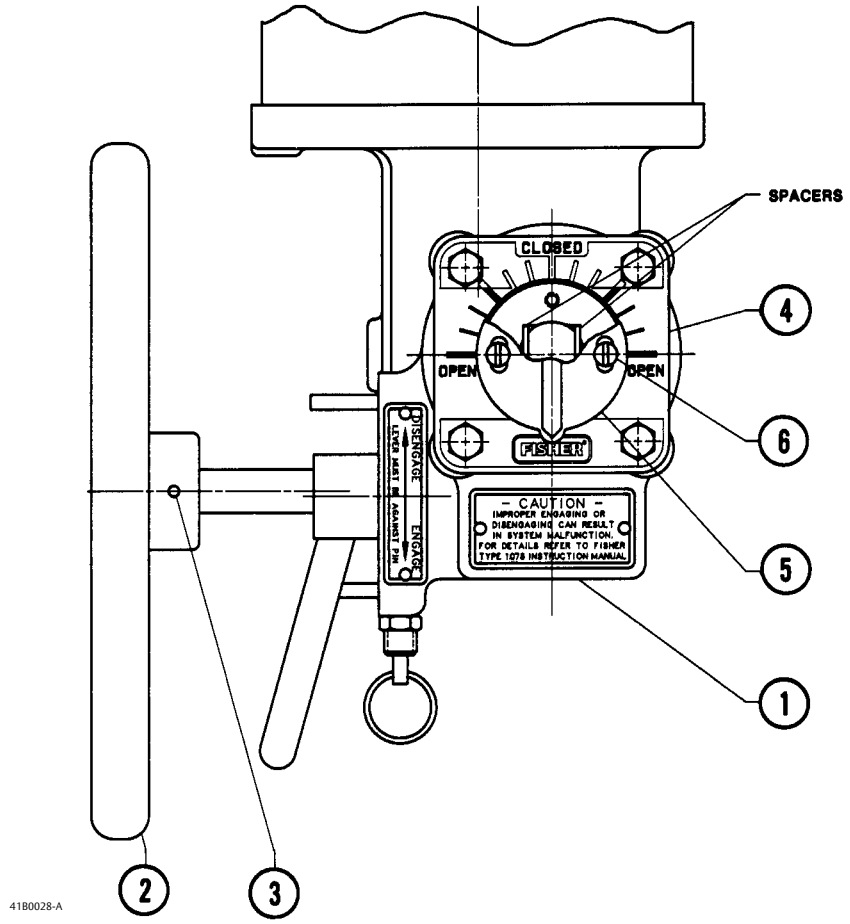
Note
For part numbers not shown, contact your Emerson Process Management sales office.

Note
A new lever and splined adaptor (figure 6) are needed on most assemblies for field installation of the 1078 onto the 1051 sizes 40 & 60, 1052 sizes 40, 60, & 70, and 1061 sizes 30, 40, 60, 68, 80, & 100 actuators.

Manual Actuator Assembly (figures 3, 4, and 5)

Key	Description
1	Actuator
2	Handwheel
3	Pin, steel
4	Travel Indicator scale, stainless steel
5	Travel Indicator Pointer, stainless steel
6	Machine Screw, steel (2 required)
9	Shaft Adaptor

Figure 3. Fisher 1078 Declutchable Manual Actuator Mounted on a 1066 Actuator



Field Mounting Parts

For 1051 and 1052 Size 33 Actuators

Description
Lever (lever replacement is required for F and G)
Stub shaft
Pin

For 1066 and 1066SR Actuators

Description
Extended Hub

For 1061; and 1051 & 1052 Sizes 40, 60 and 70 Actuators

Note

Most assemblies require installation of a new lever to complete the installation. Contact your Emerson Process Management sales office.

Description
Lever

Figure 4. Fisher 1078 Declutchable Manual Actuator, Sizes 2A, 1A, B, C, and D

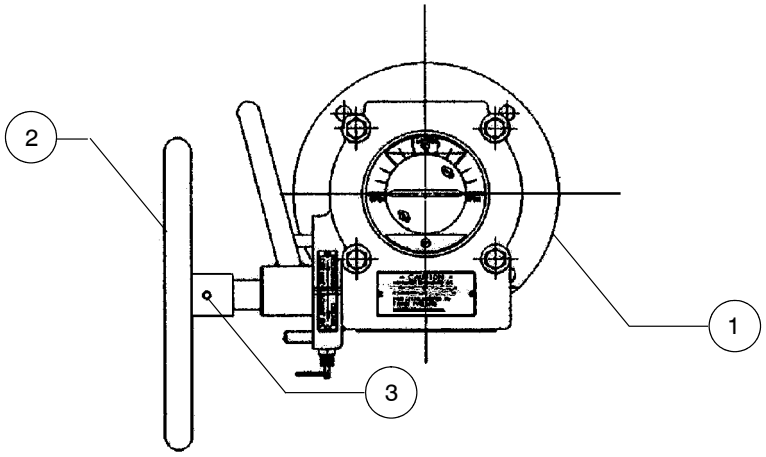


Figure 5. Fisher 1078 Declutchable Manual Actuator, Size II-FA

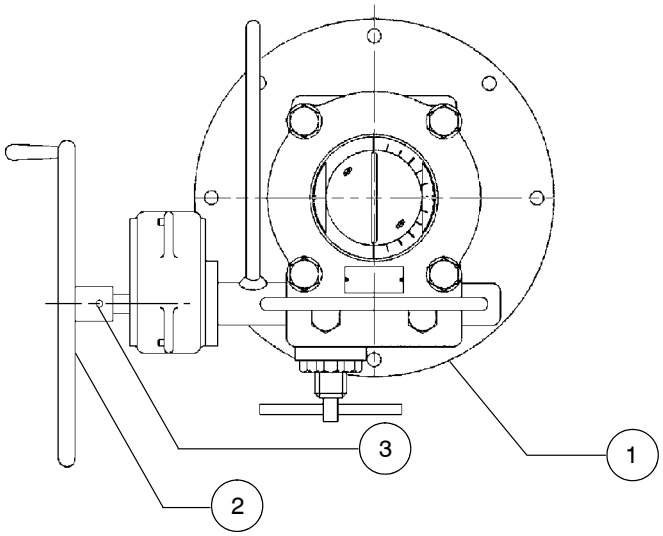
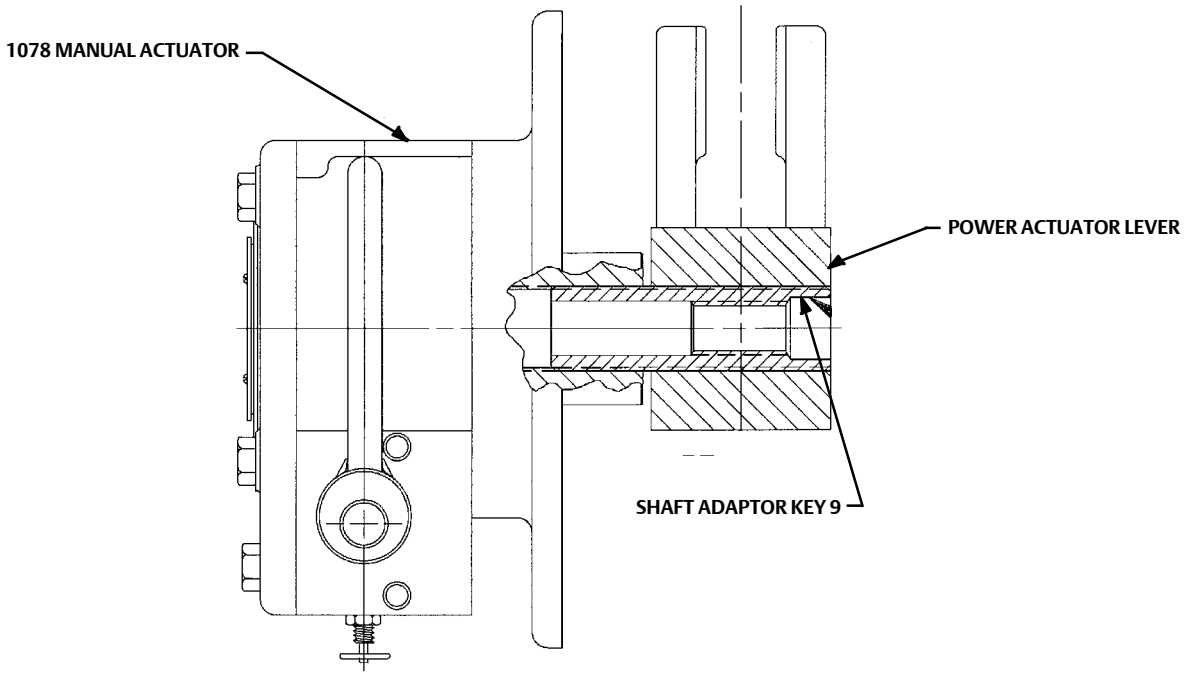


Figure 6. Lever and Splined Adaptor



NOTE:
PROPER ASSEMBLY OF SHAFT ADAPTOR KEY 9 WHEN REQUIRED
B2458

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